



**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2016

**MATHEMATICAL LITERACY P2
MEMORANDUM**

MARKS:

150

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RM	Reading from a table/Reading from a graph/Read from map
F	Choosing the correct formula
SF	Substitution in a formula
J	Justification
P	Penalty, e.g. for no units, incorrect rounding etc.
R	Rounding /Reason

This memorandum consists of 10 pages.

QUESTION 1 [21]			
Ques	Solution	Explanation	Level
1.1	<p>Two bedroomed flats in 1 block = 2×3 = 6</p> <p>Total no of flats in 8 blocks = 6×8 = 48</p> <p>One bedroomed flats = 2×3 = 6 ✓M</p> <p>Total no of one bedroomed flats = 6×8 = 48</p> <p>Total no of flats = $48 + 48$ = 96 ✓CA</p>	<p>1M Calculating no of both flats</p> <p>1CA Total no of flat (2)</p>	L2
1.2	<p>Income for 2 bedroomed flats</p> <p>✓M = $\frac{107,5}{100} \times 3200$ = 3440×48 = R 165 120 ✓M</p> <p>Income for 1 bedroomed flats = 2300×48 = R110 400 ✓M</p> <p>Total income = $165\ 120 + 110\ 400$ = R275 520 ✓CA</p>	<p>1M Increasing by 7,5%</p> <p>1M For 2 bedroomed flats</p> <p>1M For 1 bedroomed flats</p> <p>1CA Total (4)</p>	L3
1.3	<p>If 1 Ghanaian cedi = 3,77 South African Rand</p> <p>✓M $415 = 3,77 \times 415$ = R 1 564,55 ✓CA</p> <p>Amount outstanding = $2\ 300 - 1\ 564,55$ ✓M = R735,45 = R735 ✓CA</p>	<p>1C Using 3,77</p> <p>1CA</p> <p>1M Difference</p> <p>1CA Answer (4)</p>	L2

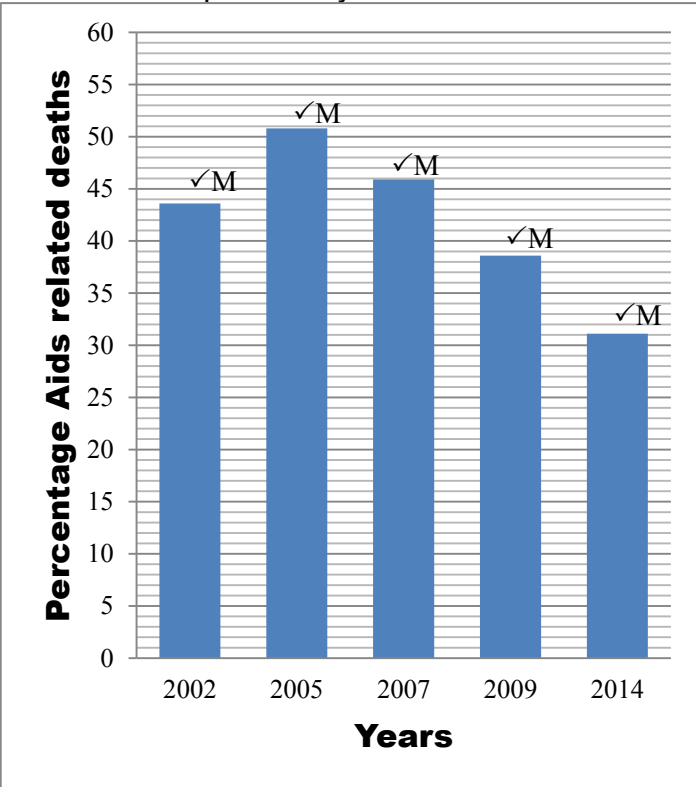
<p>1.4</p>	<p>If all occupied :</p> $48 \times 3\,440 = 165\,120 \checkmark M$ $93,75\% \times 48 = 45$ $93,75\% \text{ occupied} = 45 \times 3\,440$ $= 154\,800 \checkmark CA$ <p>Money lost = $165\,120 - 154\,800 \checkmark M$</p> $= R\,10\,320 \checkmark CA$ <p style="text-align: center;">OR</p> $93,75\% \times 165\,120 \checkmark M$ $= 154\,800$ <p>Money lost = $165\,120 - 154\,800 \checkmark M/A$</p> $= R\,10\,320 \checkmark CA$ <p style="text-align: center;">OR</p> $93,75\% \times 48 = 45 \checkmark M/A$ $48 - 45 = 3 \times 3\,440 \checkmark M$ $= R\,10\,320 \checkmark CA$ <p style="text-align: center;">OR</p> $0,0625 \times 48 = 3 \checkmark CA$ $3 \times 3\,440 \checkmark M$ $= R\,10\,320 \checkmark CA$ <p style="text-align: center;">OR</p> $100 - 93,75\% = 6,25\% \checkmark \checkmark M/A$ $= 6,25\% \times 165\,120 \checkmark \checkmark M/A$ $= R\,10\,320 \checkmark CA$	<p>CA from 1.1.1 1M Total income</p> <p>1CA</p> <p>1M getting the difference 1CA</p> <p>1M Calculating 93,75% 1CA Answer 1M Subtracting 1CA</p> <p>MA For 45 1CA Difference 1M Multiplying by 3440 1CA Answer</p> <p>1M Calculating 6,25% 1CA 1M Multiplying by 3440 1CA</p> <p>1MA Difference between 100% and 93,75% 2M 1CA (4)</p>	<p>L4</p>
<p>1.5</p>	<p>People in 8 blocks</p> $36 \times 8 = 288 \checkmark M/A$ $\frac{37,5}{100} \times 288$ $= 108 \checkmark CA$ <p>Children = $288 - 108$</p> $= 180 \checkmark CA \checkmark MA$ <p style="text-align: center;">OR</p> $\frac{62,5}{100} \times 288 = 108 \checkmark MA$ <p>Children = $288 - 108 \checkmark M$</p> $= 180 \checkmark CA$	<p>1MA Calculating the number of people 1CA 1M Subtraction 1CA Answer</p> <p>2M Using 62,5% 1CA 1M Subtraction 1CA Answer (5)</p>	<p>L2</p>
<p>1.6</p>	<p>Probability = $\frac{1}{96} \checkmark A$</p>	<p>CA from 1.1.1 1A numerator 1A denominator (2)</p>	<p>L2</p>

QUESTION 2 [29]				
2.1	2.1.1	Range = max – min $78 = 132 - A$ (min) ✓M $A = 132 - 78$ ✓M $= 54$ ✓CA	1M Concept of range 1M Subtracting 1CA (3)	L2
	2.1.2	Mean = $\frac{\text{sum of the numbers}}{14}$ ✓MA $90 = \frac{65+79+B+98+54+68+90+76+84+102+132+121+B+B}{14}$ $90 \times 14 = 969 + 3B$ ✓S $1260 = 969 + 3B$ ✓M $1260 - 969 = 3B$ $291 = 3B$ $\frac{291}{3} = B$ Mode = 97 ✓CA	CA From 2.1.1 1MA Sum of values divided by 14 1S 1M Multiplying and adding B's 1A (4)	L4
	2.1.3	\checkmark MA 54 65 68 76 79 84 90 97 97 97 98 102 121 132 Q_2 (median) = $\frac{90+97}{2}$ ✓A ✓M $= 93,5$ ✓CA Q_1 (lower Quartile) = 76 ✓CA Q_3 (upper Quartile) = 98 ✓CA	CA from 2.1.1 and 2.1.2 1MA Arranging in ascending order 1M Adding the 2 values 1M Dividing by 2 1CA Median 1CA Q_1 1CA Q_2 (6)	L3
	2.1.4	In paper 2 the mean is lower than in paper 1 ✓✓R therefore paper 1 was performed better than 2 OR Paper 2 was more difficult ✓✓R OR Paper 1 was more easier ✓✓R	2R 2R 2R (2)	L4
	2.1.5	Probability = $\frac{3}{14}$ ✓A ✓A	CA from 2.1.1, 2.1.2 and 2.1.3 1A numerator 1A denominator (2)	L2
2.2	2.2.1	Costs for venue A ✓M $= R1\ 500 + R1\ 200 + (R150 \times 66)$ $= R12\ 600$ ✓CA Costs for venue B = $R\ 1\ 000 + 220 \times 66$ $= R\ 15\ 520$ ✓CA Difference = $15\ 520 - 12\ 600$ $= R\ 2\ 920$ ✓CA	1M Multiply by 66 1CA Cost for venue A 1CA Cost for venue B 1CA Difference in cost (5)	L3

	2.2.2	<p>Graph to show costs of venues A and B</p> <p>costs in rands</p> <p>No. of learners</p> <p>Venue B</p> <p>Venue A</p>	<p>1M Plotting 0 and 1000</p> <p>1M For every 3 values plotted correctly</p> <p>1CA Joining points to form a line</p> <p>1CA Breakeven point</p> <p>(6)</p>	L3
	2.2.3	<p>Breakeven point is where the cost of Venue A is equal to the cost of venue B ✓O for the same number of learners ✓O</p> <p>Number of learners = 20 ✓RG</p> <p>Cost = R5 700</p>	<p>1A Same cost</p> <p>1A Same number of learners</p> <p>1RG For reading the cost and the number of learners</p> <p>(3)</p>	L3

QUESTION 3 [30]				
3.1	3.1.1	<p>Annual income = 368 450</p> <p>Tax bracket from table = 284 101 – 393 200 ✓RT</p> <p>Tax = 59 314 + 31% of the amount above</p> <p>= 284 100 ✓SF</p> <p>= 59 314 + 0,31(368 450 – 284 100)</p> <p>= 59 314 + 0,31 x 84 350 ✓S</p> <p>= 59 314 + 26 148,50 – [(270 x 2) + 181 x 12] ✓M</p> <p>= 85 462,50 – 13 257 – 8652 ✓M</p> <p><u>R 63 552,50</u></p> <p>= $\frac{12}{12}$ ✓M</p> <p>= R5 296,04 ✓M</p> <p>Monthly = 368 450 ÷ 12</p> <p>= R30 704,17</p> <p>$\frac{5 296,94}{30 704,17} \times 100$</p> <p>= 17,25% ✓CA Accep17,3%</p>	<p>1RT Correct tax bracket</p> <p>1SF</p> <p>1S</p> <p>1M Subtracting rebates</p> <p>1M Subtracting medical aid credits</p> <p>1M dividing by 12</p> <p>1M Monthly Income</p> <p>1CA % (8)</p>	L4
	3.1.2	<p>Tax payable ✓M</p> <p>= 85 462,50 – (13 257 + 7 407 + 2 466)</p> <p>= 85 462,50 – 23 130</p> <p>= 62 332,50 – 8 652 ✓M</p> <p>= 52 680,50</p> <p>$\frac{52 680,50}{12} = R 4 473,38$</p> <p>Tax would be less ✓J</p>	<p>1M Adding rebates</p> <p>1M subtracting rebates</p> <p>1J (3)</p>	L4

	3.1.3	<p>Option 1 = $30\,704,17 \times \frac{6,9}{100} \times 3$ $= 6\,355,76 \checkmark M/A$</p> <p>Amount = R $30\,704,17 + 6\,355,76 \checkmark M/A$ $= R\,37\,059,93 \checkmark CA$</p> <p>Option 2:</p> <p>Year 1 = $\frac{106}{100} \times 30\,704,17 \checkmark M$ $= 32\,546,42 \checkmark CA$</p> <p>Year 2 = $\frac{106}{100} \times 32\,546,42$ $= 34\,499,20 \checkmark CA$</p> <p>Year 3 = $\frac{106}{100} \times 34\,499,20$ $= R\,36\,569,16 \checkmark CA$</p> <p>Advise to use option 1 because there is more $\checkmark O$ money in the investment at the end of the period</p>	<p>1MA Multiply by 6,9% and 3</p> <p>1MA adding interest 1CA</p> <p>1M Multiply by 10,6% 1CA</p> <p>1CA Year 2</p> <p>1CA Year 3</p> <p>1O (8)</p>	L4
3.2	3.2.1	<p>50 ℓ model: Surface area = $(2 \times \pi \times r \times l) + (\pi \times r^2 \times 2) \checkmark \checkmark SF$ $= (2 \times 3,142 \times 225 \times 610) + (3,142 \times 225 \times 225 \times 2)$ $= 862\,479 + 318\,127,5 \checkmark S$ $= 1\,180\,606,5 \text{ mm}^2 \checkmark CA$</p> <p>100 ℓ model: Surface area = $(2 \times \pi \times r \times l) + (\pi \times r^2 \times 2)$ $= (2 \times 3,142 \times 275 \times 840) + (3,142 \times 275 \times 275 \times 2)$ $= 1\,451\,604 + 475\,227,5 \checkmark S$ $= 1\,926\,831,50 \checkmark CA$ $\frac{1\,926\,831,50}{2} \checkmark M$ $= 963\,415,75 \checkmark O$</p> <p>Not equal to the surface area of the 50 ml geyser</p>	<p>2SF Substitution in the formula 1S Simplification 1CA Surface Area</p> <p>1S Simplification 1CA Surface Area 1M Dividing by 2</p> <p>1O (8)</p>	L4
	3.2.2	<p>Length using a ruler = 50 mm $\checkmark A$ Actual length 840 mm Scale is 50:840 $\checkmark A$ $= 1:16,8 \checkmark CA$</p>	<p>1A Measure 50 mm 1A Scale 1CA Accept 49 – 51 mm (answers will be 1:17,1 – 1:16,5) (3)</p>	L3

4.2.2	<p>Total number of births $= 1\ 125\ 755 + 1\ 132\ 500 + 1\ 141\ 468 +$ $1\ 152\ 319 + 1\ 163\ 629 + 1\ 173\ 164 + 1\ 184$ $867 + 1\ 196\ 395 + 1\ 207\ 711 \checkmark M$ $= 10\ 477\ 808 \checkmark CA$</p> <p>Total number of Aids related deaths $= 343\ 194 + 297\ 659 + 257\ 504 + 228\ 051 +$ $213\ 864 + 211\ 839 + 203\ 293 + 189\ 376 +$ $171\ 733$ $= 2\ 116\ 513 \checkmark CA$</p> <p>Difference $= 10\ 477\ 808 - 2\ 116\ 513$ $= 8\ 361\ 295 \checkmark CA$</p>	<p>1M Addition 1CA Total (births)</p> <p>1CA Total (deaths)</p> <p>1CA Difference (4)</p>	L2												
4.2.3	$\frac{1\ 207\ 711 - 1\ 196\ 395 \checkmark M}{1\ 196\ 395 \checkmark M} \times 100$ <p>$= 0,95\% \checkmark CA$</p> <p>Incorrect $\checkmark O$</p> <p style="text-align: right;">Accept 0,9%</p>	<p>1M Difference 1M Correct denominator</p> <p>1CA Finding % 1O</p> <p style="text-align: right;">(4)</p>	L2												
4.2.4	<p>Bar graph to show percentage Aids related deaths over a period of years</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Percentage Aids related deaths</caption> <thead> <tr> <th>Year</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>2002</td> <td>43</td> </tr> <tr> <td>2005</td> <td>51</td> </tr> <tr> <td>2007</td> <td>46</td> </tr> <tr> <td>2009</td> <td>39</td> </tr> <tr> <td>2014</td> <td>31</td> </tr> </tbody> </table>	Year	Percentage	2002	43	2005	51	2007	46	2009	39	2014	31	<p>5M 1mark for each correct bar</p> <p style="text-align: right;">(5)</p>	L2
Year	Percentage														
2002	43														
2005	51														
2007	46														
2009	39														
2014	31														

	5.1.4	<p>Dimensions = $3\text{m} \times 4\text{m}$ $= 3\,000\text{mm} \times 4\,000\text{mm} \checkmark\text{C}$</p> <p>Using 780mm by 600mm $\checkmark\text{A}$ $= \frac{4\,000}{780} \times \frac{3\,000}{600}$ $= 5 \times 5$ $= 25$ cupboards $\checkmark\text{M}$</p> <p>10 will fit $\checkmark\text{CA}$</p>	<p>1C Conversion to mm 1A Using correct values</p> <p>1M Calculating number of cupboards 1O Conclusion (4)</p>	L4
5.2	5.2.1	<p>$17+19+20+22+26+28+29+30+31+32+33+2(34)+5(35)+2(36)$ $= 602$</p> <p>No. of people = $\frac{1}{3} \times (602 - 2 \text{ wheelchairs})$ $= 200 \checkmark\text{M/A}$</p> <p>2Men + 3men = 2 : 3 $\checkmark\text{CA}$ $\therefore \text{Men} = \frac{200}{5} \times 2$ $= 80 \checkmark\text{CA}$ OR</p> <p>Women = $\frac{3}{5} \times 200 \checkmark\text{MA}$ $= 120 \checkmark\text{CA}$</p> <p>Men = $200 - 120$ $= 80 \checkmark\text{CA}$</p>	<p>1MA Number of people in hall</p> <p>1M Using concept of ratio</p> <p>1CA Number of men</p> <p>1M Concept of ratio 1CA Number of women</p> <p>1CA number of men (3)</p>	L3
	5.2.2	<p>Row A15 Row B17 $\checkmark\text{A}$ Row V33</p>	<p>1A First row 1A Second row 1A Third row (3)</p>	L3
	5.2.3	<p>$\frac{32}{602} \checkmark\text{A}$ $= 0,053156146$ $= 0,053 \checkmark\text{CA}$</p>	<p>1A numerator 1A denominator 1CA 3 decimal places (3)</p>	L3
	5.2.4	<p>Enter through door 4, turn right and go straight to the end of the seats. Turn left and go straight past 8 rows. On the 9th row turn left. The seats are in row M seat numbers 2 and 3 $\checkmark\checkmark\checkmark$</p>	<p>3A for clear directions to their seats (3)</p>	L4
	5.2.5	<p>Short-sighted person will be on D1 $\checkmark\text{A}$ Farsighted person will be on T12 $\checkmark\text{A}$ Short-sighted people can see things which are closer whereas longsighted people can see things which are far $\checkmark\text{A}$</p>	<p>1A Correct seat number 1A Correct Seat number 1O Reason (3)</p>	L4
TOTAL: 150				